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Therapeutic potential of the vagus nerve in cancer

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Highlights

- Accumulating evidence points at a protective role of the vagus nerve in cancer pathologies
- The vagus nerve modulates innate and adaptive immune responses
- Vagus nerve stimulation shows antitumor effects by attenuating TNFα secretion by TAMs
- Vagus nerve stimulation arrests MDSC proliferation and enhances the efficacy of DCs
- Vagal signaling alters T-cell responsiveness in normal and pathophysiological conditions

Abstract

Accumulating evidence points to a beneficial effect of vagus nerve activity in tumor development. The vagus nerve is proposed to slow tumorigenesis because of its anti-inflammatory properties mediated through ACh and the α7nAChR. Since α7nAChRs are widely expressed by many types of immune cells we hypothesized that the vagus nerve affects the tumor microenvironment and anticancer immunity. We found direct evidence in studies using animal cancer models that vagus nerve stimulation alters immunological